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ON THE DISTINGUISHING CHARACTERS OF THE BRITISH CETACEA.

BY THE EDITOR.

It frequently happens that large Cetaceans are unexpectedly cast up on some part or other of our coast, run aground, or are killed within sight of land and towed ashore. Few persons being acquainted with these creatures for want of opportunity to study and compare their various forms, or for want of access to descriptions, the species often remains undetermined until the carcase is cut up, and the various portions of it become dispersed. In this way many a good opportunity of adding to our knowledge of these marine Mammalia is unfortunately lost.

Under these circumstances it has occurred to me that a list of the British *Cetacea*, with a brief enumeration of the distinguishing characters of each, may be of service in assisting in the first instance towards the identification of a species, whose history and perhaps habits, if known, may then be ascertained from other sources. Once the species is made out, it is not difficult, as a rule, to learn more about it. The difficulty at starting is to name it.

At the present day it is perhaps scarcely necessary to observe that Whales and Dolphins, notwithstanding their external appearance and oceanic life, are not fishes, but marine mammals, which bring forth their young alive, and nourish them in precisely the same way as do the terrestrial mammals.

The order *Cetacea* has been divided into two very natural groups—the Whalebone Whales, *Mystacoceti*, and the Toothed Whales, *Odontoceti*.

The former are characterized by the absence of teeth and the possession in lieu thereof of great plates of horny fibre, called “baleen,” depending from the palate, and known as the “whalebone” of commerce. The latter are destitute of whalebone and possess teeth, either in one jaw or both, sometimes few and rudimentary, sometimes numerous, and always single-rooted and similar to one another.

Again, the Whalebone Whales possess olfactory organs, and have a double orifice to the blow-hole; the ribs are very slightly articulated to the vertebræ, and the sternum or breastbone consists of a single piece, which is attached to the first pair of ribs only.

The *Odontoceti*, or Toothed Whales, on the contrary, have no olfactory nerve; a single external orifice to the blow-hole; the anterior ribs more closely united to the vertebræ; and the sternum, which, in the young at least, is composed of several segments, is attached to several of the ribs.

The first group, *Mystacoceti*, may be conveniently divided into two families—the *Balænidæ*, to include the Right Whales; and the *Balænopteridæ*, to include the Hump-backed Whale and the Rorquals, or Fin Whales.

The second group, *Odontoceti*, have been divided by Professor Flower into three families—the *Physeteridæ*, to include the Cachelots and Ziphioid Whales; the *Platanistidæ*, for the reception of the long-snouted fresh-water Dolphins of India and South America, of which we have no representatives in our waters; and the *Delphinidæ*, to include the Dolphins and Porpoises, with the Narwhal, and the White Whale, or Beluga.

The following Table will convey some idea of the number and variety of the British *Cetacea*, and will at the same time exhibit, to a certain extent, their affinities. The nomenclature adopted is, with a few exceptions, where older names seemed to deserve priority, that of the second edition of Bell's ‘British Quadrupeds,’ in which work will be found much useful information on the subject of British Whales and Dolphins, and, by way of introduction, an excellent account of their organization.

BRITISH CETACEA.

I. MYSTACOCETI, Whalebone Whales.

FAMILY.	GENUS.	SPECIES.	ENGLISH NAME.
BALÆNIDÆ	<i>Balæna</i>	<i>mysticetus</i> , Linn.	Greenland Right Whale
"	"	<i>biscayensis</i> , Eschr.	Atlantic Right Whale
BALÆNOPTERIDÆ	<i>Megaptera</i>	<i>boops</i> , Fab.	Hump-backed Whale
"	<i>Balænoptera</i>	<i>musculus</i> , Linn.	Common Rorqual
"	"	<i>Sibbaldii</i> , Gray	Sibbald's Rorqual
"	"	<i>laticeps</i> , Gray	Rudolphi's Rorqual
"	"	<i>rostrata</i> , Fab.	Lesser Rorqual

II. ODONTOCETI, Toothed Whales.

PHYSETERIDÆ	<i>Physeter</i>	<i>macrocephalus</i> , Lin.	Sperm Whale, or Cachelot
"	<i>Hyperoodon</i>	<i>rostratus</i> , Chemn.	Beaked Whale, or Bottle-head
"	"	<i>latifrons</i> , Gray	Broad-fronted Beaked Whale
"	<i>Ziphius</i>	<i>cavirostris</i> , Cuv.	Cuvier's Whale
"	<i>Mesoplodon</i>	<i>bidens</i> , Sowerb.	Sowerby's Whale
DELPHINIDÆ	<i>Monodon</i>	<i>monoceros</i> , Linn.	Narwhal
"	<i>Delphinapterus</i>	<i>leucas</i> , Pallas	White Whale, or Beluga
"	<i>Orca</i>	<i>gladiator</i> , Lacép.	Grampus, or Killer
"	<i>Grampus</i>	<i>griseus</i> , Cuv.	Risso's Grampus
"	<i>Globiocephalus</i>	<i>melas</i> , Trail.	Pilot Whale
"	<i>Phocæna</i>	<i>communis</i> , Cuv.	Porpoise
"	<i>Delphinus</i>	<i>delphis</i> , Linn.	Common Dolphin
"	"	<i>tursio</i> , Fab.	Bottle-nosed Dolphin
"	"	<i>acutus</i> , Gray	White-sided Dolphin
"	"	<i>albirostris</i> , Gray	White-beaked Dolphin

Family BALÆNIDÆ.

Genus *Balæna*, Linnæus.

The members of this genus, which includes the Greenland and Atlantic Right Whales, are characterized by the absence of any dorsal fin, and by having the skin of the under parts perfectly smooth, instead of being pleated or disposed in folds, as in the Fin Whales, or Rorquals. The rostrum of the skull is compressed and rounded, and the rami of the lower jaw strongly arched outwards. The baleen, or whalebone, is long; the flippers short.

Balæna mysticetus, Linn. The Greenland Right Whale.—Averages from 50 to 60 feet in length; has the head very large, and about a third of the entire length; the baleen long; 54 vertebræ and 13 pairs of ribs. The colour a dark grey, with the lower jaw and throat white. It is almost invariably found close to the polar ice-fields, although it occasionally goes as far south in winter as 46° N. lat. Its occurrence on various parts of the coast of Great Britain has been reported, but not satisfactorily proved.

Balæna biscayensis, Eschricht. The Atlantic Right Whale.—Averages from 40 to 50 feet in length, and has a much shorter head than the last-named species, not more than a fourth of its entire length. The baleen is short; the angle of the mouth depressed below the eyes. No description of the skeleton has yet been published. The colour uniform black. In all probability most of the Right Whales which have come into British waters have been of this species, which has a much more southern range than the Greenland Whale.

Family BALENOPTERIDÆ.

Genus *Megaptera*, Gray.

Characterized by the possession of a low dorsal fin, and very long flippers (hence the name), the latter about a fourth or even a third of the entire length, with undulating edges. The head is broad and flat; the tail broad and deeply forked. The skin of the throat and belly pleated.

Megaptera boöps (Fabricius). Hump-backed Whale.—The average length of this species is from 45 to 50 feet. It has 53 vertebræ and 14 pairs of ribs. The head is larger in proportion than that of the Rorqual; the tail broad and deeply forked. The skin of the throat and belly is disposed in longitudinal pleats or folds. The general colour is black above, black and white beneath; the flippers entirely white; the baleen black. It is found between 62° and 66° N. lat., whence it moves southwards at the approach of winter. At least two authenticated instances of its occurrence on our shores are on record. One was cast ashore near Newcastle; another was taken in the estuary of the Dee.

Genus *Balænoptera*, Lacépède.

Agrees with the genus *Megaptera* in having a low dorsal fin, and the skin of the under parts pleated; but differs amongst other

respects, in having a more slender body in proportion to the length, very short flippers with their edges even, a smaller and more pointed head, and a shorter tail.

Balænoptera musculus (Linn.). Common Rorqual, Finner, or Razor-back.—Averages from 60 to 70 feet in length, has 61 or 62 vertebræ and 15 pairs of ribs. In colour it is black above, shaded to a brilliant white below; flippers black; baleen slate-colour, streaked with paler shades. It inhabits the more temperate northern seas, with a much more southern range than the Greenland Right Whale, and is the only Balænoid Whale which is found in the Mediterranean. It has been met with on all parts of the British coast. The name "Rorqual" is derived from the Norse "Rorq-val," signifying a whale with pleats or folds in the skin.

Balænoptera Sibbaldii (Gray). Sibbald's Rorqual.—Averages from 60 to 80 feet in length; has 64 vertebræ and 16 pairs of ribs. The head is broad; the flippers long and broad; the dorsal fin very small. In colour it is black above, grey beneath, with whitish spots and markings; the flippers are black above and white below; the baleen uniform deep black. It is frequently met with between 63° 40' and 66° 20' N. lat., and is the commonest Fin Whale about Iceland, where it is found chiefly in summer. Specimens have been procured in Hamna Voe, Shetland, in the Firth of Forth, and elsewhere on the coast of Scotland.

Balænoptera laticeps, Gray. Rudolphi's Rorqual.—Averages from 30 to 40 feet in length; has 58 vertebræ and 14 pairs of ribs. The head is broad; the dorsal fin very small; the flippers short. In colour it is black above, white below; flippers the same; the baleen black. A specimen believed to be of this species was stranded at Charmouth, Dorsetshire, in 1840, and was described by the late Mr. Yarrell in the 'Proceedings of the Zoological Society' for that year, under the name *Balænoptera boöps*. Another was cast ashore on the Island of Islay in 1866, the skull of which is preserved in the Museum of the University of Cambridge.

Balænoptera rostrata (Fabricius). Lesser Rorqual.—The smallest species of the genus, averaging from 25 to 30 feet in length, and having 48 vertebræ and 11 pairs of ribs. The dorsal fin is much more developed than in the last-named species, and, although the general colour is the same, the flipper in this species is black, with a broad white band across it, which seems to be a constant peculiarity, and affords a good mark of distinction. It inhabits the

North Atlantic and Arctic Oceans, and appears regularly in Davis Straits, and on the coasts of Iceland, Greenland, and Norway. It has been met with also off Kamschatka, the Aleutian Islands, and Labrador. The stragglers which have accidentally reached the British Islands have been found chiefly off the eastern coasts of Scotland and England; but solitary specimens have been procured also on the coasts of Cornwall, Lancashire, and Ireland.

Family PHYSETERIDÆ.

Genus *Physeter*, Linnæus.

This genus, to which the Common Sperm Whale belongs, is characterized by an enormous head, the length of which is about one-third of the entire length of the animal; no distinct dorsal fin; and teeth instead of whalebone. In the upper jaw the teeth are generally rudimentary or absent; but in the lower jaw they are numerous, large, and conical.

Physeter macrocephalus, Linn. Sperm Whale, or Cachelot.—Averages in length 60 to 70 feet (the female smaller), and has 50 vertebræ and 10 pairs of ribs. The head is of enormous size, and composed for the most part of cavities divided by a cartilaginous substance and filled with an oily fluid, which in its congealed state forms the spermaceti of commerce.* The snout is abruptly truncated, and above it, and a little to the left, is a single blow-hole. The upper jaw overhangs the under one by some four or five feet. Although there is no distinct dorsal fin, there is a marked protuberance not far from the tail. The colour is black above, shaded to grey beneath. It is native of the tropical and warmer temperate latitudes, from which it occasionally wanders both northwards and southwards. Several specimens have been secured at various times on the east coast of Scotland, and on the coasts of Yorkshire and Kent.

Genus *Hyperoodon*, Lacépède.

This genus is distinguished by the peculiar shape of the head, which is rounded in front, with a projecting beak and comparatively small gape; the skull with two large bony crests on the upper surface of the maxillaries; no teeth in the upper jaw, and those in

* These cavities are quite distinct from that of the cranium, which is situated beneath.

the under jaw are rudimentary and concealed by the gum. The dorsal fin is small and the flippers short and rounded.

Hyperoodon rostratus (Chemnitz). Common Beaked Whale, or Bottle-head. Attains a length of from 20 to 25 feet. The beak is depressed and pointed, with a single blow-hole, crescentic in shape, concave in front. The maxillary crests are narrow, widely separated, and not higher than the occipital portion of the skull. The general colour is black above, shaded to grey beneath. This whale is a native of the North Atlantic, and in autumn frequently comes into British waters, specimens being captured nearly every year on some parts of our coast.

Hyperoodon latifrons, Gray. Broad-fronted Beaked Whale.—Attains a length of 25 to 30 feet. Differs from the last-named chiefly in the shape of the skull; the bony crests on the maxillaries are much thickened and flattened above so as almost to touch one another, and rise above the occipital portion of the skull. Nothing is yet known of the external appearance of this whale, which has been described only from its remains, portions of which have been found in Orkney, the Firth of Forth, and Morecambe Bay, Lancashire.

Genus *Ziphius*, Cuvier.

Characterized by the peculiar conformation of the skull. The rostrum is triangular in shape, at the base of which is a deep hollow into which the nares open. There are two teeth in front of the lower jaw, conical in shape, and of moderate size.

Ziphius cavirostris, Cuvier. Cuvier's Whale.—Although apparently not uncommon in the Mediterranean, is only known to have occurred once in British waters, a specimen having been taken in Hamna Voe, Shetland, in 1870, as recorded by Professor Turner, of Edinburgh.* It attains a length of about feet, and has vertebræ and pairs of ribs. Its colour is said to be steel-gray, with irregular white streaks.

Genus *Mesoplodon*, Gervais.

Distinguished from the last-named genus by the form of the skull, which has no hollow at the base of the rostrum (the latter being very slender), the nares opening directly on the surface. The teeth, two in number, which in *Ziphius* are situated in front of the lower jaw, are in this genus placed one on each side of the

* Trans. Roy. Soc. Edinb., 1872.

lower jaw at the same distance from the front, and are compressed rather than conical.

Mesoplodon bidens (Sowerby). Sowerby's Whale.—Average length from 15 to 18 feet, with 38 vertebræ and 10 pairs of ribs. The front slopes gradually to the beak. The front slopes gradually to the beak; the upper jaw is shorter and narrower than the under one, the projecting teeth on each side of the lower jaw being visible externally. The dorsal fin small; flippers the same. In colour it is described as black above and white below, the sides marked with vermicular white streaks. This species was first described by Sowerby from a specimen 16 feet in length, which was cast ashore in Elginshire. Since then others have been taken on the coast of Kerry and elsewhere in Ireland. Nothing is yet known of its distribution and habits.

Family DELPHINIDÆ.

Genus *Monodon*, Linnæus.

No dorsal fin and very small flippers. Head raised, with a small mouth and no beak. Two teeth in the upper jaw only. These are rudimentary and concealed by the gum in the female, but in the male, one (the left) is projected forward, in the shape of a long straight tusk, half the length of the body.*

Monodon monoceros, Linn. The Narwhal.—Averages 14 to 16 feet in length, with a single straight tusk 7 or 8 feet in length. In colour it is grey above, mottled with black; and white beneath, spotted with grey and black. Its usual haunts are between 70° and 80° N. lat. Three instances are on record of its occurrence on our coasts, namely, in Shetland, in the Firth of Forth, and near Boston, Lincolnshire. The word "Narwhal" signifies the Beaked Whale, from the Gothic *nar*, Icelandic *ner*, the beak.

Genus *Delphinapterus*, Lacepède.

Agrees with *Monodon* in having no dorsal fin, small flippers, a small round head, and no beak; but differs from it in having teeth in both jaws, none of which are prolonged externally. The tail is broad and powerful.

Delphinapterus leucas (Pallas). White Whale, or Beluga.—Attains a length of from 10 to 16 feet, and has 50 vertebræ and

* Occasionally, though rarely, both tusks are thus developed. There is a specimen in the Cambridge University Museum with two tusks, the left measuring 6 feet 7 inches, the right (which has been broken) 6 feet 1 inch.

10 pairs of ribs. The teeth, which are present in both jaws, vary in number from 8 to 10 on each side, and are conical in shape and often truncated. In colour it is entirely white, sometimes with a yellowish tinge. The White Whale is common in the White Sea, in Hudson's Bay, Davis Straits, and the Arctic Ocean generally, and is only accidentally found so far south as the British Islands. A few have been met with off the coast of Scotland and in Orkney. The name "Beluga" is said to be of Russian origin, being derived from "beloe," which signifies white.

Genus *Orca*, Gray.

The members of this genus are distinguished by their round head; large, conical and slightly curved teeth; high dorsal fin; flippers broad and oval; and tail broad and powerful.

Orca gladiator (Lacépède). Grampus, or Killer.* — Length about 20 feet; 50 vertebræ and 11 or 12 pairs of ribs. The upper jaw is slightly longer than the under one; the blow-hole crescentic, concave in front. The teeth, which are present in both jaws, vary from 11 to 12 on each side, and are large, conical, and slightly recurved. In colour it is glossy black above, pure white beneath, a sharp line of demarcation between the two. Above each eye is a white spot. The Grampus seems to have a wider geographical range than most of the *Cetacea*, having been met with from Greenland to the Mediterranean. Numerous specimens have been brought ashore on different parts of the coast of Scotland and England. Its voracity is astonishing, and examination of the contents of the stomach of different specimens has shown that it preys largely on seals and porpoises, and even kills and devours the White Whale.

Genus *Grampus*, Gray.

Although agreeing with *Orca* in the rounded head, high dorsal fin and large flippers, this genus is distinguished by having no teeth in the upper jaw at any age, while those of the lower jaw are few and all placed in front. The flippers, moreover, although large, are long and narrow, and placed low down. The tail is not nearly so large and broad as in *Orca*.

Grampus griseus (Cuvier). Risso's Grampus.—Attains a length of about 10 feet, and has 68 vertebræ and 12 pairs of ribs. The

* "Grampus," from *Grand-poisson*. Called "Killer" in allusion to its carnivorous habits.

forehead is rounded, and the thick projecting upper lip is separated by a hollow from the convexity of the head. The teeth, which are confined to the lower jaw, vary in number from three to seven on each side, and are all placed in front. As regards the ground colour, Risso's Grampus is very variable, being either black above and white below, or grey, passing into black above and white beneath; but it may always be distinguished by the curious way in which this ground colour is marked and covered with irregular lines and narrow streaks and spots of white. It is a rare animal, and nothing is yet known of its distribution and habits. Three specimens only have been obtained on the south coast of England.

Genus *Globiocephalus*, Lesson.

With the last-named genus the present agrees in having a rounded head, no beak, and long narrow flippers; but differs in the shape of the dorsal fin, which is long and low instead of high, and in the teeth, which are large and numerous in both jaws.

Globiocephalus melas (Trail). Pilot Whale, Ca'ing, or Driving Whale.—Averages from 16 to 20 feet, and has 56 vertebræ and 12 pairs of ribs. The jaws are short, the upper one being somewhat longer than the under one. The teeth, of which there are about 24 on each side in both jaws, are large and conical. The colour is deep black above and white below, terminating in a white heart-shaped spot on the throat. It is a native of the northern seas, but goes at least as far south as the Mediterranean, and occasionally visits our shores in some numbers.

Genus *Phocæna*, Cuvier.

This genus, which has most of the characters possessed by the two last-named genera, differs chiefly in regard to its teeth, which are present in both jaws, and are compressed, spatulate and truncated.

Phocæna communis, Cuvier. Porpoise.*—Average length 4 or 5 feet, with 65 vertebræ and 13 pairs of ribs. The lower jaw is slightly longer than the upper one. The teeth vary in number from 20 to 26 on each side in both jaws, and, as above stated, are compressed, spatulate and truncated. In colour it is black, or dusky, above, gradually shaded into white beneath. It inhabits the North Atlantic, but is seldom found far from land, and is the

* "Porpoise" from *Porc-poisson*. Often called "Hog-fish" by English sailors.

commonest of all the *Cetacea* which visit the coasts of Great Britain.

Genus *Delphinus*, Linn.

In some respects not unlike *Phocæna*, but distinguished at once by its head, which, instead of being rounded, has a prolonged beak,* and double the number of teeth.

Delphinus delphis, Linnæus. Common Dolphin.—Exceeds the Porpoise in size, attaining a length of from 6 to 8 feet. The vertebræ vary from 70 to 75 in number. The jaws are long and powerful, the lips thin and compressed. The teeth, of which there are from 40 to 50 on each side of both jaws, are acute and slightly curved, and those in the upper jaw fit very regularly between those in the lower. The colour is black, gradually shaded through grey on the sides to pure white beneath. The Common Dolphin appears to have a much more extensive range than the Porpoise, being found in the more temperate regions on both sides of the North Atlantic and in the Mediterranean. It is by no means uncommon off our own coasts, and is not unfrequently captured in fishermen's nets.

Delphinus tursio, Fabricius. Bottle-nosed Dolphin.—Much larger than the common species, averaging from 8 to 12 feet, but with not much more than half the number of vertebræ (41) and half the number of teeth (20 to 25 on each side of both jaws). The beak is shorter than in the last-named species, as also are the dorsal fin and flippers. The name "Bottle-nosed" has been bestowed from the shape of the skull.

Delphinus acutus, Gray. White-sided Dolphin.—About equal in size to the Common Dolphin, averaging from 6 to 8 feet in length, but with a larger number of vertebræ (80 or 82) and a smaller number of teeth (28 to 36 in each side of both jaws). It may be distinguished at a glance by its colour. It is black above and white beneath, like its congeners, but the flanks are yellow or brownish grey, with an oval white patch in the centre, which gives it a marked appearance. Two or three specimens only of this rare species have been captured in the Orkneys.

Delphinus albirostris, Gray. White-beaked Dolphin.—Averages 7 to 9 feet in length, with 88 or 90 vertebræ and 15 pairs of ribs. The beak elongated and gradually tapering to the extremity. The

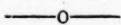
* The French sailors sometimes call the Goose-beak "*Bec d'oie*."

teeth are small and curved, and vary in number from 23 to 25 on each side of both jaws. This species, like the last-named, is easily distinguished by its colour, which is deep purplish black above; while the nose and a well-defined line along the upper jaw, as well as the whole of the lower jaw and belly, are cream-colour, varied in parts with chalk-white, which contrasts finely with the deep black colour of the back. This Dolphin also inhabits the North Atlantic, but does not appear to be common. Only three or four specimens have been met with on the east coast of England.

It is not a little remarkable that the number of species of Whales and Dolphins which have been ascertained to have occurred on the coasts of Great Britain and Ireland is in excess of what has been recorded for the European Continent. This, no doubt, is owing to the fact of their remains having been more carefully collected and identified, and more attention given to the study of these animals by English than by continental naturalists.

The late Dr. Gray, who made a special study of the order *Cetacea*, published several articles on the species frequenting or occurring in the British Islands, to which the reader should refer. In 'The Annals and Magazine of Natural History' for 1846 (vol. xvii., p. 82), he gave a list of the British *Cetacea* containing seventeen species which he had the opportunity of personally examining, either entire or in osteological fragments sufficient to enable him to determine them. In the 'Proceedings of the Zoological Society' for 1847 (p. 117), he printed some additional observations on the subject; and in the volume of 'Proceedings' of the same Society for 1864, he published a paper "On the *Cetacea* which have been observed in the Seas surrounding the British Islands," in which he attempted to condense all the original matter in the various antecedently published works on the British Whales and Dolphins, and gave the results of his examination of all the specimens he could collect. This paper is illustrated with figures of the more characteristic bones. In 'The Zoologist' for 1873 (pp. 3357—3364 and 3421—3433) he published a "Catalogue of the Whales and Dolphins inhabiting or incidentally visiting the Seas surrounding the British Islands." To all of these articles, as well as to the more recent papers and monographs by Prof. Flower in the 'Proceedings' and 'Transactions' of the Zoological Society, the reader would do well to refer. Nor

should we omit to indicate as special sources of information the "Recent Memoirs of the *Cetacea*," edited by Professor Flower, and published by the Ray Society, and Professor Van Beneden's 'Osteographie des Cétacés;' while the excellent chapters devoted to British Whales and Dolphins in the second edition of Bell's 'History of British Quadrupeds' afford an amount of information not elsewhere to be obtained in so concise a form.



ON A SPECIMEN OF THE BEAKED WHALE RECENTLY
KILLED IN THE MENAI STRAIT.

BY HENRY LEE, F.L.S., F.Z.S.

THE Ziphioid Whales, to which group the present species belongs, occupy an intermediate position between the Cachelots and the Porpoises and Dolphins, and are distinguished from other toothed whales by many important structural differences.

"In the upper jaw there are no functional teeth, which are only occasionally represented by rudiments which never cut the gums, while those of the lower jaw are reduced to either one or two pairs, which are often greatly developed, but sometimes remain almost rudimentary. The snout is produced into a more or less distinctly marked 'beak,' the flippers are short and rounded, and the dorsal fin placed very far back. The blow-hole is crescentic, and two diverging furrows in the skin of the throat assume the form of the letter V with its angle directed forward."*

Four genera are recognized by Professor Flower, in his memoir on this group of whales,† of which the first and best marked is that now under notice, *Hyperoodon*.

This genus is characterized by its rounded forehead, distinct beak, and comparatively small mouth, and especially by the presence of two bony crests on the upper surface of the maxillary bones of the skull, which rise nearly as high as the occipital portion.

In the present species these raised crests are sharp-edged above, and separated by a considerable interval. In an allied species, *Hyperoodon latifrons* (Gray), they are much thickened

* Bell's 'History of British Quadrupeds, including the Cetacea,' 2nd ed., p. 421.

† Trans. Zool. Soc., 1872, pp. 203—234.

and flattened above, so as almost to touch one another. Figures of the skulls of both are given in Bell's 'British Quadrupeds,' 2nd ed., pp. 424, 427.

The genus is further characterized by the rudimentary appearance of a single pair of teeth in the lower jaw, and by the condition of the palate, which is covered with hard tubercles.

The presence or absence of teeth in the Beaked Whale has been not unfrequently disputed, from the fact of their being often so covered and concealed by the gum as to lead an ordinary observer to suppose that they were absent; and although this species of whale is not so rare as many others which are included in the list of British *Cetacea*, those who have opportunities of examining specimens do not always take the trouble to note the result of such examination. It may therefore be desirable to place on record the following observations.

On the 15th September, 1877, I received information from Dr. Robert Brisco Owen, of Beaumaris, that late on the previous Tuesday evening (September 11th) the Menai Strait had been visited by a female whale, which he thought must be a Beaked Whale, or "Bottle-nose." She was entrapped among the rocks at Penmon, and was shot by some of the quarrymen there. Although several rifle-balls passed through her body they were not immediately fatal, and the men said that for some time "she fought desperately with her tail." She was eventually killed, and towed by a boat to Penmon Pier, about a mile distant, thence taken to Bangor on a timber-waggon, and there publicly exhibited.

The measurements taken were as follows:—

	Feet.	Inches.
Total length - - - -	24	-
Greatest girth - - - -	12	6
Height of dorsal fin - - -	1	4
Length of pectoral fins - -	2	-
Diameter of caudal fin - -	8	-
Length of snout - - - -	2	-

From Dr. Owen's description, and from a photograph which he kindly sent me, I was enabled to identify the whale as the Beaked Whale, *Hyperoodon rostratus* (*H. butskopf* of Lacépède), an identification which was confirmed by Professor Flower, whom I consulted. It was represented in the photograph as it lay on

its side on the waggon under a tent. Its great weight—said to have been five tons—was shown by the depth to which the wheels of the waggon had sunk in the ground. The under part of the body was exposed to view, and the two remarkable diverging furrows in the throat which are characteristic of the species were plainly shown.

This whale is also known as the "Two-toothed Whale," the name *Delphinus bidentatus* having been given to it by Hunter, from its having two teeth in the extremity of the lower jaw. This title has, however, led to much confusion in the identification of this species, because these two teeth are permanently concealed by the gum, and only become apparent when that is removed. Hence the discrepancies which exist between descriptions from skeletons and from examples in the flesh.

The specimen in question having been exhibited at Bangor until decomposition had become conspicuous, was taken back to Penmon, and placed upon the shore there. The quarrymen who captured it, after having removed the blubber, which produced about 1500 lbs. of oil, dragged the carcase lower down the beach, thinking that the action of the water would clean the skeleton. There it was allowed to lie, and as its position was beyond low-water mark of any but low spring tides, Dr. Owen was for a long time unable to examine it. But on my directing his attention to the interest attaching to the two rudimentary teeth, he succeeded in obtaining possession of the lower jaw, which was exactly four feet in length. He was at first inclined to think that the teeth mentioned did not exist, but having cleared away the gum from his specimen he came upon the two teeth, which were near the point of the rostrum, and were as sharp as needles and as pointed. Until he had removed the whole of the gum with boiling water they were quite invisible. They were carefully preserved *in situ*, and not removed from their sockets.

The statement made to Dr. Owen, that two or three other whales were in company with the female specimen killed, is interesting. As this is not a gregarious whale, her companions were probably a male and a young one. I am informed that a small whale was cast ashore at Carnarvon a few days afterwards, but I have been unable to obtain any particulars concerning it.

ON THE APPEARANCE AND BREEDING
OF *PASTOR ROSEUS* IN THE PROVINCE OF VERONA.

BY EDOARDO DE BETTA,
Member of the Royal Venetian Institute.*

[The following is the concluding portion of a memoir entitled "Le Cavallette e lo *Storno roseo* in Provincia di Verona nell' anno 1875," read at a meeting of the Royal Venetian Institute of Sciences, Letters and Arts, 29th of November, 1875, and printed in the 'Atti' of that body (vol. ii., ser. 5). The former part, relating to a wonderful and destructive visitation of Locusts—with which, in popular estimation, the appearance of the Rose-coloured Starlings was connected—we have been compelled for want of space to omit. The reader will do well to compare the following interesting account with that given by the Marchese O. Antinori, and translated by Mr. Sclater for 'The Zoologist' in 1857 (1st series, pp. 5668–5672).—Ed.]

THE Rose-coloured Pastor, *Pastor roseus*, is a most formidable enemy of locusts. It has been asserted† that as its occurrence is deemed in many countries no fallacious indication of their appearance, so on any arrival of such a scourge, these birds are seen by the hundred or the thousand to follow the hordes which devastate the country.

Without wishing to believe that this was our case,—that is to say, that to the invasion of the locusts was solely due the arrival, as before stated, of the Rose-coloured Starling in the Veronese Province, and especially at Villafranca,‡—I believe I shall not be far from the truth in thinking that the presence of the *Acridium* in the interior of the country, and in quantities so immeasurable, determined the stay here of the numberless troops in which these wandering birds reached us, having been originally perhaps more likely directed towards another part of Europe.

Whatever we may think, however, it was a sufficiently strange fact, at which all naturally marvelled, that at the very time of the invasion of the locusts there should appear so great a number of Rose-coloured Starlings as we believe could not be reckoned at less than from twelve to fourteen thousand individuals,

* Translated by William Long, F.S.A., and communicated by the Rev. A. C. Smith, M.A.

† Brehm, 'La Vita Degli Animali' (Italian translation), iii., p. 324.

‡ The chief town of the administrative district, on the Verona and Modena Railway, 17 kilometres from that city.

and perhaps even more, if we are to credit the statements of some of the inhabitants of Villafranca. Nor ought we to be surprised that some attributed this to a miracle, and recognized in it the direct hand of Providence.

As is known, *Pastor roseus* inhabits the warm countries of Africa* and Asia, and is pretty well distributed over all the regions of the Caucasus. Essentially a wandering bird, it migrates more or less regularly to the South of Europe. It has been many times observed in Greece, and more rarely in Spain, France, Belgium, Germany, Switzerland and England. In Italy this very beautiful bird shows itself rarely enough, and is of irregular passage, though it may now be said that some individuals at more or less lengthened intervals have been taken in nearly every part of our country.

As regards the Province of Verona, it is particularly noticeable that *Pastor roseus* figures among the rarer species, many years sometimes passing without an example being even seen; or else showing itself in little parties of from six to ten or twelve, in May or June, and staying but a very few days. It was therefore quite exceptional that, in June, 1870, a hundred or more wandered for about a week in the country along the Veronese shore of the Benaco [Lago di Garda].

This being premised, the scientific interest of the notes now given will be more easily understood. They refer to the appearance, and more especially to the nidification and propagation of *Pastor roseus*, a subject with which modern authors are not much acquainted, and the statements made with regard to the reproduction of this bird in Italy may hitherto be regarded more as suppositious than anything else.

Thus the illustrious Savi (Orn. Tosc. i. p. 180; Orn. Ital. i. p. 354) was only able to announce, on the testimony of others, the nidification of many Rose-coloured Starlings in the Mugello in 1740, concluding his account with the remark that the propagation of this species is "little known." So, too, wrote Perini (Orn. Veron. p. 118), when he said we might infer that a certain pair had bred in the Province of Verona in 1840, from the fact of his having in his possession a female in which perfect eggs were found. Lastly, Salvadori ('Fauna d'Italia,' Uccelli, p. 167) considers the occasional breeding of some pairs is possible, from the fact of his having seen several very young examples taken in Piedmont in September.

* [This is a mistake.—ED.]

I must not omit one more notice by Prof. Pellegrini, who was assured that a pair nested in 1873 near Recoara, and that the nest was found and taken with the young.

But, after all, it is clear that this is the first time in which the Rose-coloured Starling has bred in Italy in such a way and in such large numbers as was exhibited this year at Villafranca. It will be most useful, and not less needful, for me to set forth as succinctly as possible all that I have been able to collect from trustworthy testimony, or that I have myself observed in frequent and repeated excursions from Verona with the same object.

The arrival of *Pastor roseus* at Villafranca happened on the 3rd June. About four o'clock in the afternoon of that day a small flock of from eighteen to twenty of these birds alighted on the high and ruined walls within the castle, and was followed in about half an hour by another flock of about one hundred, which by their continuous cries attracted the attention of all the people dwelling in the castle precincts. In a short time some country people assembled at the place, and soon witnessed another greater sight, for towards evening appeared many thousands of these Starlings which, joining with the first comers, stopped there till dusk, when all left the place they had visited, and dispersed in very numerous troops over the open country. It is easier to imagine than to narrate the discussions held on that day, and the astonishment of the inhabitants, who were greatly vexed at the sudden loss of these beautiful but unknown birds which had just for the first time met their sight.

But things did not thus continue, for towards 3 A. M. of the next day the inhabitants of Villafranca were unexpectedly awakened by the deafening cries of from twelve to fourteen thousand Rose-coloured Starlings which at that hour arrived there, so as to take absolute possession of the castle. A Veronese periodical ('L'Arno,' No. 147, 4th June, 1875) wrote on this subject that the Starlings covered the walls in such excessive numbers as to make them seem alive, and completely black in colour.

From this moment another sight presented itself to the bystanders, for the new-comers without delay began an angry war against the other birds which had their ordinary abode in the castle—Common Starlings, Swallows, Sparrows and Pigeons. These last were soon compelled to retreat to the higher towers. All the others were put to flight after a long and obstinate contest, which again was followed

by another, not less obstinate, between the Rose-coloured Starlings themselves. The reason of this was that they had to fight for possession of one or other of the hundreds of holes and cavities in which the pairs might lodge. The holes being insufficient to harbour them all, by far the greater number were compelled to occupy the roofs of the houses over half the district,—that is, of the part situated between the castle and the church,—and then renewing the fight by driving away the Common Starlings and Sparrows.

Here, too, was soon a new cause for astonishment in the incredible anxiety and activity with which the Rose-coloured Starlings remaining in the castle precincts gave themselves up to cleansing the captured holes and fissures. These they very soon cleared of every encumbrance by rolling to the foot of the wall stones (even of great weight), bits of rock or brick, sticks, straws, skulls, and other portions of the skeletons of animals which had died there naturally, or had doubtless been the victims of Polecats (*faine*) and Owls.

The cleaning completed, the work of nest-building began with daybreak on the 5th June. Here I will remark that the nests occupied both the length and breadth of the whole available site, and that—roughly composed of small sticks, little branches, straws, hay, grasses, and other dry herbs, the whole disposed in a shapeless mass—they presented in their midst a limited hollow space to contain the eggs, and this was irregularly lined with herbaceous fibres, leaves, mosses and feathers.

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It was not until the 17th June that I was able to ascertain for certain that eggs were laid in any nest. They were from five to six in number, and of an ovato-conic form, with a very brittle shell, and of an uniformly white colour, with a slight greenish tint.

On the 10th July the young were completely covered with feathers, and their ultimate development was so rapid, that on the 14th they were all seen to emigrate with their parents from Villafraanca, taking a direct course towards Gazòl, Palù, Teze, and Isola della Scala, to continue thence, by short journeys towards the south, their emigration to other lands. One of the young birds killed on the 14th I made a point of having preserved, and presented to the museum of this Institute.

Not to omit any notice of the habits of a bird about which so little is known, I subjoin my observations as follows:—

Pastor roseus, like the Common Starling, is one of the most sociable and cheerful, merry and lively birds. Always busy and restless, it may be seen running here and there, accompanying every movement with its cries. The song of the male is a continual chatter (*cicaleccio*), mixed with harsh and disagreeable sounds. Both one and the other begin in the early morning, continuing for a length of time, and renewed at intervals after feeding. The males, always at strife, may be seen pursuing one another and exchanging blows with their bills while in the most curious attitudes, and with their long black crests elevated and expanded. They exhibit a great affection for the hen birds, which, never leaving the nest during the period of incubation, are protected and fed by them with all assiduity. Nearly all the males left their nests in the evening to pass the night at a distance of some kilometres from Villafranca on high trees in the environs of Castoza and S. Lucia dei Monti. So many were taken in the nets called "clausini" (which are used in different parts of Italy in a lucrative trade in birds) that the number of these males was reduced to the miserable limits that ultimately fell under the observation of everyone. Male and female in turn indefatigably provided for their young by bringing beakfuls, which consisted exclusively of locusts, and interesting indeed it was to see the quantity of Rose-coloured Starlings which with this object scoured the country to a greater or less distance, in flights of from ten to twenty, or even forty, returning in the same united fashion to their offspring.

In the roof of a certain house in Villafranca the Rose-coloured Starling remained even in company with the Common Starling. I had already observed that shortly after the arrival of *Pastor roseus* in that district, three or four of these birds strayed as far as Verona, and stopped there for some days in perfect harmony with the many Common Starlings which annually breed on the roof of a tall factory adjoining my house, and situated like it in the south towards the Adigetto and good-sized garden.

I have said that the departure of *Pastor roseus*, with its new and numerous progeny reared in Villafranca, took place on July 14th. I may add that on the morning of the 12th a general exit of the parents and young into the country had already been observed, whence but a few adults returned in the evening. It was also

observed that, in the afternoon of the 13th, Rose-coloured Starlings assembled in very great numbers on the fruit trees in the garden of the castle—a signal for a general departure the next day.

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A strong incentive to set at naught the law for the protection of these and other birds in the breeding season arose from the fact that the Rose-coloured Starlings were earnestly sought after from every quarter and paid for at the high price of from three to five *lire* a-piece. Ultimately twelve, fifteen and eighteen *lire* were asked for a pair—male and female. In this way some speculators made some hundreds of *lire* by a clandestine trade which it was impossible altogether to stop. Of the young Starlings a real traffic was made, many persons having procured a considerable number. On the arrival of nearly every train at the Villafranca Station children and men stood ready to offer the travellers little cages with one or two Starlings in them, now known under the name of the “*famosi Storlini di Villafranca*,” which the travellers thought themselves only too fortunate to secure.

Some persons thought fit to affirm that the capture of *Pastor roseus* was necessary for the protection of the fruit, which they said suffered much more injury from the birds than could be counter-balanced by the destruction of the locusts. But the truth of this assertion can be directly denied, as well from the declarations of the country people of Villafranca as from the result of my own observations. I can safely assert that if the Rose-coloured Starlings sometimes ate cherries, the loss of this produce was always in such inconsiderable proportions as to make the statement inconclusive. Greedy enough of fruit, on the other hand, did these poor birds prove when in captivity, and any one could see with what avidity they pounced upon the cherries, figs and pears that were given them, and particularly on mulberries. But one cannot be surprised at this, since they were in want of their chief natural food, locusts and other insects. It is certain that I have always seen them refuse fruit when it was possible to give them insects and chrysalids of silkworms in sufficient quantity.

Having mentioned the Rose-coloured Starlings which were kept prisoners, I may add that they are very easily domesticated, and may be said to have the same habits as the Common Starling, whose vivacity and activity they possess in nearly an equal degree, especially in seeking and contesting their food with their fellow-

prisoners. They bathe frequently, almost immoderately. They take nearly any sort of food; for instance, the flour of Indian corn mixed with grated cheese, paste, boiled rice, minced polenta, little bits of raw meat, and other things. In spite of their facility in adapting themselves to a state of captivity, it is not to be assumed that all Rose-coloured Starlings can support it without ill consequences or for long. Within two months a great mortality was noticed among them, amounting to about eighty per cent. The young were subject to a disease which swelled their toes, and that was almost always followed in a short time by death.

* * * * *

In conclusion, I may remark that the appearance of *Pastor roseus* in such thousands, and its nidification with us to such an extent, ought to be regarded as a real benefit to the country round Villafranca, where the locusts did so much damage, as well as a piece of good luck to the clever speculators; and lastly, in what concerns us most, it is a new and important fact in the history of Italian Birds.

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OCCASIONAL NOTES.

ORANGE VARIETY OF THE MOLE.—A pale orange variety of the common Mole was caught, a few weeks since, at Halton, near Tring, by Billington, the village mole-catcher and birdstuffer, and brought to me.—H. HARPUR CREWE (The Rectory, Drayton-Beauchamp, Tring).

[See page 225, where a somewhat similar variety of the Mole is recorded by Mr. Prior to have been obtained near Bedford.—ED.]

NOTE ON THE LONG-EARED BAT.—In the neighbourhood of Wilsden the Long-eared Bat, *Plecotus auritus*, was extremely abundant in 1876, and this was all the more noticeable from the fact of its comparative scarcity in previous years, its place hitherto having been occupied by the Common Pipistrelle.—E. P. P. BUTTERFIELD (Wilsden).

WADING BIRDS IN AUTUMN AT HOLY ISLAND.—On the 16th August I shot a Wood Sandpiper, a young bird of the year, which rose at a distance and settled again, and which I thought at first was a Green Sandpiper. It made a twittering noise, something resembling the note of the Common Sandpiper, and I shot it as it rose the second time from some longish grass and weeds. Green Sandpipers were not uncommon for a few

days. I saw two on the 13th August flying together, and apparently just arrived, as they came from the sea. On the 16th I saw another. On the 21st I got a young Ruff from a flock of five, and the same day several Green Sandpipers were seen at flooded pools amongst the sand-hills. They were very difficult to get near, as they always rise on seeing one approach, fly more unsteadily than a Snipe, and generally go straight into the air, seldom settling again within sight. On the 23rd I again saw several Green Sandpipers and wounded one, but did not get it. It settled on the open hill-side, as I expected dead, but rose quite wild again and flew to the beach,—the only occasion I ever saw one on the beach,—when it again rose suddenly and went away out of sight. On August 25th Green Sandpipers were still about. On the 28th, when looking for one, I saw a *Colias Edusa* butterfly, which I tried to catch, but failed to do so. No Green Sandpipers were seen after this. The first young Knots were killed on August 22nd, and a mature drake Pochard on the 30th. Mature Sanderlings appeared on the coast on the 16th August. I shot two (male and female) from different flocks, one of four, the other of nine birds. The old birds appear to pass on directly, for none are seen after the young arrive. Those obtained on their return from breeding are in a rather peculiar state, evidently changing from summer to winter plumage, but very little in the moult, the bare places on the breast being nearly obliterated, showing that some time has elapsed since they were sitting. These birds must have partially moulted on the back during the summer, the renewed feathers on the back having evidently come partially in summer plumage (that is faintly mottled), but as the feathers had grown they appear to have become grayer by degrees; and no doubt, from the broad edge of the new feathers and their indistinct markings, the remainder of the dark and cream-colour on each feather would wear out altogether as the season advanced and form part of the winter plumage of the bird. There is something curious in this species in this respect. I have met with old Sanderlings sometimes several weeks earlier. The first young bird of this species was obtained on August 18th. On the 14th September I got a Richardson's Arctic Gull whilst feeding on a dead herring on the shore. I did not before know they fed in this manner. The first young Bartailed Godwit was shot on the 19th September. Plenty were seen long before this, but in large flocks and wild. On August 16th I found red feathers of this bird cast where a flock had been preening themselves. An old male Bartailed Godwit, nearly in its plain gray winter plumage, but with numerous red feathers on its under parts and a few summer feathers remaining on its back, was killed on September 14th. It was moulting very regularly, the fifth primary from the end on each side being short, and the other four longest feathers were unchanged. This is the first bird I have seen killed here in a similar state of plumage, which is curious. The species lays four eggs, and therefore, if there were the

ordinary number of old and young, every third bird would be an old one, supposing all the young birds grew up; but how different is the case, not one in fifty being adult! It would be wrong to suppose that because young Wood Sandpipers, Green Sandpipers and Ruffs are met with so early in the season they have therefore been bred in this country. They are simply passing on their regular autumnal migration, just as the Common Sandpiper leaves us so soon as the young are able to fly well. A few hundred miles are nothing to these birds. The three species just named breed comparatively near us, whilst the Common Godwit, Knot and Sanderling, which I believe breed exclusively within the Arctic Circle arrive only a few days after them. It seems quite possible the three first-named species were attracted on their migration by the unusual quantity of fresh water on the grass-lands.—CHARLES MURRAY ADAMSON (North Lesmond, Newcastle-on-Tyne).

HOOPOES NEAR SALISBURY.—I send the following account of the occurrence of six Hoopoes which were seen in this neighbourhood during the month of June last, and which account I believe to be thoroughly trustworthy, having seen and questioned the eye-witness myself. A young man named William Holbeck, who knows well all the common birds of our district, was floating gently down the river in a boat, about two miles and a half from Salisbury, when he was attracted by the sight of some curious birds that he had never seen before. They were flitting about some osier-beds on some little islands in the middle of the stream. They consisted apparently of two old birds and four young ones, the younger birds having the appearance of having scarcely reached their full feathering, and being more distinctly marked than the old ones. He watched them closely for some ten minutes, during which time they took little or no notice of him, the two old birds flitting on in front and uttering a kind of chirping noise as they apparently hunted for insects and caterpillars on the willows, and the younger birds following them. He came home in a great state of excitement, and begged Mr. Norwood, the head man in his office, to come out at once with his gun and secure some of them, as they were birds he had never seen before, and which he felt sure must be rare ones. He described them as being about the same size as Thrushes and as being barred with black and white on the back and tail, the old birds having a splendid top-knot, which they every now and then extended “in this way”—*i. e.* holding up his hand and spreading out his fingers apart from each other as he said so. Mr. Norwood (who is himself an ardent ornithologist and birdstuffer, and from whom Holbeck had gathered a good deal of information about birds) brought out Morris’s book of birds, and showed him several of the plates before he turned to the Hoopoe, which bird he told me, from his clerk’s description, he at once conjectured they were; but directly he turned to the picture of the Hoopoe, Holbeck, with much emphasis, declared,

"That's the bird—that's the bird I saw! I am certain of it!" Mr. Norwood could not, however, possibly leave that evening, and on Sunday they were nowhere to be seen, and I much regret that I cannot glean any further information concerning them; but I have no doubt in my own mind—neither has Mr. Norwood—that they were Hoopoes, and apparently they must have been bred somewhere in the neighbourhood, possibly in some of the osier-stumps on these little islands, which lie very quiet and undisturbed at that spot. It was on Saturday, either the 9th or 16th of June, that Holbeck saw the birds; but I was not informed of it until last month, otherwise I might have been able to glean some further information concerning them. I may add that the Hoopoe is not altogether an uncommon bird in this district. I have the following notices of its occurrence in our more immediate neighbourhood:—One shot at West Knoyle by Thomas Grey in 1865; a male bird shot at Breamore in May, 1869; one shot on Mr. Crook's farm at Dean about 1871; one seen at West Knoyle by Mr. E. Baker in 1872; one shot at Upton Scudamore, and stuffed by King of Warminster, in 1873: one shot at Mere by Richard Brine on April 2nd, 1873; one picked up dead on Mr. Rawlence's farm at Wilton in 1874. This last bird being also one of a little party of these birds shot at on the race-course, just above his farm, some days previously.—ARTHUR P. MORRES (Britford Vicarage, Salisbury).

EGG OF THE PALLID SWIFT, *Cypselus pallidus* (Shelley).—I am not aware that the egg of this species has ever been described, and as I have an undoubted specimen—one of the pair taken by Favier in 1861 at Tangier—I venture to give some particulars as to its measurement, &c. Favier says, in his MS. notes (*vide* Irby's 'Ornithology of the Straits of Gibraltar'), "This Swift is found near Tangier on passage, crossing to Europe in April and May. Some remain to breed; but it is the least common of the species, being seen alone or in pairs in company with *C. apus*, which circumstance makes it difficult to distinguish them. I found a pair in July, 1861, nesting in company with some House Martins, *Chelidon urbica*; the nest was simply an old nest of that Martin, which the Swifts had appropriated, and contained two eggs of the usual *Cypselus* shape, their longitudinal circumference being 64—66 millimetres." I obtained my specimen from Olcese, Favier's successor, while I was quartered at Gibraltar in 1873. It has a label, in Favier's indifferent hand-writing, "*Cypselus murinus*," that being the name (applied by Brehm in 1855 to a bird *presumably* of this species) by which he knew the bird. It agrees exactly with his measurement, and measures $\cdot 92 \times \cdot 61$ inches, being, of course, pure white in colour and without any gloss. This is somewhat smaller than average eggs of *C. apus*, which measure $\cdot 94 \times \cdot 65$ inches; but the total length of *C. pallidus* is only 6 inches, while that of *C. apus* is

7½ inches. *C. pallidus* breeds at Gibraltar, where Colonel Irby observed it nesting in the "weep" holes of the masonry of a portion of the old sea-defences this last spring. Attempts were forthwith made by an energetic officer of the Rifle Brigade to get at the eggs; but these were unfortunately found to be at a great distance from the mouth of the holes, in some cases as much as 10 feet, and, though various contrivances were resorted to, all that could be reached were broken in the attempt.—SAVILE G. REID, R.E.

ANECDOTE OF A ROUGH-LEGGED BUZZARD.—The following circumstance has been communicated to me, as having recently occurred in this neighbourhood, and is, I think, worthy of record:—A Rough-legged Buzzard pounced on a good-sized rabbit, and, flying off with it in its talons, settled on the top of a pole where a pole-trap happened to be set for hawks. In this trap the Buzzard was caught by one leg. It did not, however, relinquish its prey, but breaking the fastening of the trap it flew to a distance of about fifty yards with the trap hanging to one foot and the rabbit grasped in the other. It then alighted, and when found was in the act of devouring the rabbit, notwithstanding its being itself held captive by one leg in the gripe of the pole-trap.—J. H. GURNEY (Northrepps, Norwich).

TERNs AND SKUAS IN THE ESTUARY OF THE MOY.—On the 11th May Common Terns appeared in the Estuary in their usual numbers, and by the 20th and 21st an unusually large flight arrived, comprising both the Common and Arctic species, but in what proportion the two arrived I could form no opinion, though I shot a few of both for comparison. They remained in the Bay and Estuary for about a week, and then disappeared, leaving only the usual stock of Common Terns that breed in the neighbourhood. This flight was accompanied by six Richardson's Skuas, three of which were in dark and three in light-coloured plumage. As they all had long tails, no doubt they were all old birds. I was very much interested in watching their habits, and perceived that, although they all consorted together when resting on the water or the sands, they generally kept in pairs, a light and a dark bird resting quite close together. Forgetting that Saxby, in his 'Birds of Shetland,' states that he has had birds of both sexes and all ages in both plumages as well as in an intermediate stage, and also that he has taken a light and a dark-coloured nestling from the same nest, I imagined that each couple might be male and female, the former being the light and the latter the dark-coloured bird, and in order to ascertain the fact I shot three of them. One of these had a pure white throat and breast, the white extending completely round the back of the neck, with a faint tint of straw-colour at the sides of it. The second had only the white breast, with a faint tinge of the straw-colour also on the sides of the neck; and the third was dark all over, having a few traces of a lighter brown colour on the breast and sides of the neck.

On skinning and dissecting them I found that my surmise as to sex was incorrect, for all three proved to be females, having eggs in the ovaries varying in size from No. 8 to B shot.—ROBERT WARREN (Moyview, Ballina, Co. Mayo).

THE ATTRACTIVE POWER OF LIGHT ON BIRDS.—I have a very curious instance to give you of the attractive power of bright lights on birds. On or about August 29th, 1876, the officers of one of Her Majesty's regiments were seated at mess at Dover, and, the night being warm, the windows were open, when, to their great astonishment, they saw numbers of small birds coming in, while they were sitting at dinner. The building in which they were stands high up on the Castle Cliff, and any migrants journeying over the sea or along the shore would readily be attracted by it, when brilliantly lighted up, as it was on this occasion. A regular hunt ensued, and about a hundred birds were presently caught. Whether that was all, or whether any got away, my informant did not know. A few which were brought to him to name were Common Redstarts and Garden Warblers, and from the description of the officers it appeared that some of the others were Wagtails. On the same night the Swifts were affected in the same way as the small birds which flew into the officers' mess-room. My father, who chanced to be passing through Dover, was sleeping at the Lord Warden Hotel, and in his sitting-room was a chandelier of gas, and three times Swifts, attracted by the glare of it, flew against the panes of glass. I have no doubt it was a dark night, but it was not observed to be unusually so, and no note was taken of the direction of the wind, or whether it was foggy or not.—J. H. GURNEY, JUN. (Northrepps, Norwich).

PIED FLYCATCHER AND BLACK REDSTART IN SOMERSET.—A Pied Flycatcher was killed near Williton in April, and brought to me for identification in September last. Perhaps I should have heard of it sooner had there not been some possible "qualms of conscience" about the Bird Act. This bird so seldom occurs in this part of the county—in fact, I think only one Somerset specimen has been noted in 'The Zoologist' since Mr. Haddon's was obtained near Taunton some time before 1871—that I am very sceptical as to the correctness of Mr. Crotch's note on its breeding in this county, in the 'Proceedings' of the Somersetshire Archæological and Natural History Society. The Black Redstart is by no means so uncommon, especially along the coast, where I think it may be considered a regular, though never a numerous, autumnal visitant. The bird in question, an adult female, was taken in the town of Taunton about the 14th November, and kept alive for a short time by its captor, but he does not appear to have known much about it, for he fed it on hemp-seed, and consequently starved it. It was eventually brought to me for identification minus the head, which had been eaten by the cat.—CECIL SMITH (Bishop's Lydeard, Taunton).

NOTE ON THE PIED WAGTAIL.—A friend, writing to me on the 5th December, mentioned a circumstance in the economy of our Water Wagtail which may interest your readers. "A pair of these Wagtails did a thing this summer which I should imagine to be unusual—they built in an old rick of faggots which had not been touched for two years, and reared a brood. Before the brood had left the nest the old birds took possession of an old nest near by in the same rick, laid their eggs, and reared a second brood, continuing to feed the first brood during the second operation of incubation. Before the second brood had flown off, the first had quitted the nest, and the old pair immediately returned to it, and, without deserting the second brood, proceeded to lay for a third time. There was every prospect of a third hatching, but the bird was disturbed,—one of the eggs broken in the nest,—which caused it to be forsaken. Is this an unusual thing? It seems to me a very curious instinct, very anti-Malthusian, and, in a bird with so few natural enemies, uncalled for, the determination to rear such a lot of progeny."—E. H. RODD (Penzance).

SPOTTED REDSHANK IN THE COUNTY MAYO.—A Spotted Redshank visited us last autumn, and haunted the shores of the Moy Estuary for some weeks in October and November; but owing to the very stormy weather we had then I was unable to make any attempt to secure it. The first intimation I had of its presence in the locality was early in October, when on two occasions I heard a faint call like that of the Spotted Redshank, but too indistinct to be recognized with certainty. However, on the 3rd November, when returning from Bartragh in my punt, I again heard the same peculiar call, sufficiently near and distinct to be clearly recognized, and shortly afterwards I saw the bird flying very high in the direction of Bartragh. On the 10th I heard it frequently calling amongst the islands at Rozerk, and on the 17th I fell in with it on the Moyview shore, feeding with some Common Redshanks, and had such a good view of it through a glass that I was able to see most distinctly the dark line between the bill and eye, which would have enabled me to identify the species, even if I had not heard its call.—ROBERT WARREN (Moyview, Ballina).

SPARROWHAWKS FLOCKING.—One bright afternoon, about the 8th or 9th September, on the heaths bordering Hants and Dorset, my attention was attracted by a noise which resembled the "weet, weet, weet" of the Wryneck. On first hearing it I was at a loss to know from whence the sound proceeded; but I was not long in doubt, for on looking up I saw far above my head, in the clear bright sunshine, a number of birds playing with and chasing each other in rapid circular flights, very gracefully executed, uttering at the same time the cry above alluded to. The birds proved to be *nine* Sparrowhawks, two of which seemed considerably less in size than the others, but all possessed equal powers of wing. Upon enquiry

I learnt that a nest of Sparrowhawks had been reared in a fir wood near, and that the pair of old birds had been seen about the locality all the summer. Those I saw were undoubtedly the inhabitants of this nest; but the question arises, could they all have been of one family? and even provided two were the parents, is it not very unusual for this species to lay so many as seven eggs? or is it possible that the young of two nests were thus congregating? If so, it seemed to me that they were unnaturally social, for I had never before seen more than a pair of these birds together on the wing.—G. B. CORBIN (Ringwood, Hants).

WHITE-FRONTED GOOSE.—On the 20th October Mr. Collins Splatt, of Plymouth, presented me with a White-fronted Goose, *Anser albifrons*, which had been killed a few days before on a down near Colstock, and was said to have associated with some tame geese. It was, without exception, the finest in plumage I ever saw, the bands on the breast and belly being so broad and close together as to make the under parts appear almost wholly black. On examination I found the stomach full of the common Dutch clover, *Trifolium repens*, mixed apparently with a dark kind of gravel. Several geese of the same species were afterwards exposed for sale in our markets, all of which were said to have been killed in Cornwall.—JOHN GATCOMBE (Stonehouse, Plymouth).

ALBINO SPECIMENS OF THE COMMON SNIPE AND WRYNECK.—In the spring of the present year an albino specimen of the Common Snipe was killed at the Wilstone Reservoir, near Tring, by one of the keepers of Baron Lionel de Rothschild, and is now in his possession. A few days ago (October 23rd) a pure white Wryneck, a young bird of the year, was brought to me. It had been killed a few weeks previously in the grounds of Mr. R. S. Colet, of Wendover Hall. It is now in the collection of Sir John Harpur Crewe, of Calke Abbey, near Derby.—H. HARPUR CREWE (The Rectory, Drayton-Beauchamp).

PURPLE GALLINULE IN NORFOLK.—Another specimen of the green-backed species was shot in Norfolk on the 1st November, and there is no reason for thinking it had escaped from captivity. I had a letter on the 5th of that month from the owner, in which he said that it was shot at Stalham, which is only a few miles from Hickling, where the last recorded specimen was obtained. It is in just the same plumage as the other, I hear, and a male bird.—J. H. GURNEY, JUN. (Northrepps, Norwich).

MERLINS NESTING IN A TREE.—At a recent meeting of the Natural History Society of Glasgow, Mr. James Lumsden exhibited a pair of Merlins, *Falco asalon* (male and female), which had been shot from the nest in a tree on the banks of Loch Lomond, in July last. Mr. Lumsden stated that he exhibited these birds in order that the somewhat unusual

position of the nest might be recorded. The Merlin, in this country, is usually found nesting on the ground or in rocks, and what renders the present case of greater interest is the fact that the ground all round the tree was just of such a character as is usually chosen by the Merlin for nesting, showing that the tree could not have been fixed on for want of another suitable place. The nest occupied appeared to be a deserted one of *Corvus corone* or *C. cornix*. Nests of Merlins in trees are not uncommon in Lapland.

SPRING MIGRATION OF BIRDS.—In 'The Zoologist' for December last (p. 513), Mr. Cordeaux, writing on the "Spring Migration of Birds on the East Coast," says, "My impression is that the males of this species (Tree Pipit), also the male Willow Wrens, precede the females by some days; we do not hear their notes, however, before their mates arrive." From my inability to discriminate the males from the females of the above species, except by their song, I am unable to say whether the males do arrive before the females. It is, however, certain that the Willow Wrens did not give any indication of their presence by their song until the 19th April, although the female birds must have arrived a few days earlier, as we received no increase of numbers after the 16th. I first heard the Tree Pipit on the 22nd April, but did not hear it again for at least a week, though the pair were to be seen frequently in the locality, the weather being still excessively cold. What particularly struck me, as bearing on the point at issue, was the absence of the song of the Yellow Wood Wren in all the more open and hilly woods during the whole of May, whilst they were in full song in the sheltered and low-lying districts on the 20th. This was noticeable both in Airedale and Wharfedale. The unusually cold spring of 1877 might, to some extent, if not mainly, account for the reticence of our summer migrants after their arrival.—E. P. P. BUTTERFIELD (Wilsden).

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 15, 1877.—Dr. GWYN JEFFREYS, F.R.S., Vice-President, in the chair.

Messrs. W. Joshua (of Cirencester), W. S. Lawson, B.A. (of St. Peter's College, Cambridge), and the Rev. M. A. Mathew (Vicar of Bishop's Lydeard, Somerset), were ballotted for and elected Fellows of the Society.

Mr. J. Jenner Weir exhibited a case of butterflies captured on the Alps, at a height of between 8000 and 9000 feet. These were interesting from the fact that they presented considerable similarity to, without being

specifically identical with, those obtained by the naturalists of the late North Polar Expedition.

The papers read at this meeting all related to the Arctic Fauna. The first was a "Report on the Insecta (including *Arachnida*) collected by Captain Feilden and Mr. Hart during the recent Arctic Expedition," by Mr. R. M'Lachlan. This specially deals with materials obtained from the parallel stretching from 78° N.; in other words, shows the results of an examination of the Insect fauna of Grinnell Land—that of West Greenland, as far as Disco Island, having already received considerable attention from O. Fabricius, Schiödte, and others; while that of East Greenland has been treated of in the "Report of the Second German North Polar Voyage." The collection made by the 'Polaris' Expedition has not appeared in a connected form. Mr. M'Lachlan's analysis of Capt. Feilden and Mr. Hart's collection runs thus:—*Hymenoptera*, 5; *Coleoptera*, 1; *Lepidoptera*, 13; *Diptera*, 15; *Hemiptera*, 1; *Mallophaga*, 7; *Collembola*, 3; *Araneida*, 6; and of *Acarida*, 6 species; giving a total of 57 species. Bearing in mind these were collected in localities between 78° and 83° N. lat., and that among them are thirty-five specimens of gaily-coloured butterflies and two species of humble bees, it is evident that the insect fauna of this so-called northern "land of Desolation" is after all not so meagre as might have been anticipated. The paucity of the *Coleoptera* is not a little remarkable, the comparative abundance of the *Lepidoptera* as striking a feature. In this collection there are no very important novelties, but the marked varieties of certain already known species warrant the suspicion that they represent a local insect fauna. It is stated that many lepidopterous larvæ were found in the stomachs of Gulls and Terns shot by members of the Expedition, so that only a small portion can be left to be transformed into the perfect state. Judging from the material which passed through his hands, Mr. M'Lachlan regards it as having an evident affinity with the fauna of Lapland, and he inclines to the belief in a former extensive circumpolar fauna, of which the present is but a lingering remnant.

The second paper read was a "Preliminary Notice on the Surface Fauna of the Arctic Seas, as observed in the recent Arctic Expedition," by Dr. Edward L. Moss, late Surgeon H.M.S. 'Alert.' The author observed that the seas north of the Greenland settlements are subject to such varying conditions at different seasons of the year that their surface fauna cannot be supposed to be very constant. According, however, to what was met with in this voyage, he divides the watery area into three zoological regions:—(a) A district in the latitude of Melville Bay temporarily monopolized by Infusorian *Peridinea*; (b) a north water region inhabited by Pteropods, certain aberrant Tunicates, *Sagitta*, and free *Hydrozoa*; (c) a subglacial region, comparatively azoic, so far as surface life is concerned. Remarks on species captured and other matters altogether form an interesting

account of "deck-work," so to say, on board the 'Alert' by the above-mentioned naturalist, who in previous contributions on southern surface fauna has shown much activity and capacity in this field of observation.

The third paper was "On the Annelids of the British North Polar Expedition (1875-6)," by Dr. W. C. M'Intosh. In this collection, dredged between 79° and 82° N., there were some eight species not found among the Annelids procured by H.M.S. 'Valorous' in Davis Straits. All, however, have already been entered in the catalogue of the Arctic Fauna as obtained elsewhere, the majority of the species having a wide range in northern waters. Some even are common to the British Seas, the North Atlantic generally, and the Gulf of St. Lawrence. The value of the present collection must therefore depend on its being taken along with series from other localities. A critical comparison with American forms is desirable before clear views can be arrived at respecting the geographical distribution of the northern Annelids.

A lively and interesting discussion followed the reading of these papers. Among the speakers were Capt. Sir George Nares, Dr. Rae, Capt. Feilden (who humorously related incidents of insect capture—no easy matter in these inhospitable regions), and the Vice-President, Dr. Gwyn Jeffreys, whose valuable physical researches and dredging experiences while in the 'Valorous,' as tender to the Arctic ships, have already appeared in the Royal Society's publications. A volume of Dr. Moss's sketches of marine creatures, with maps and diagrams, illustrated the regions in question and the several subjects brought forward.

December 6, 1877.—Prof. ALLMAN, F.R.S., President, in the chair.

The following gentlemen were elected Fellows of the Society:—Messrs. J. Nugent Fitch (Newman Street, W.), J. S. Gamble (Assist. Conserv. Forests, Simla), F. S. Piggott (Essex Court, Temple), A. B. Stewart (Rowcliffe Lodge, Langside, Glasgow), and Prof. John Macoun (Belleville, Canada).

Mr. Charles Stewart gave the gist of a paper "On certain Organs of the *Cidaridæ*," illustrated by some beautiful pencil drawings from nature. The main points of this communication may thus be summarized:—Among the Sea Urchins, or *Echinoidea*, the families *Diadematidæ*, *Echinometridæ*, and *Echinidæ* have long been known to possess external branchiæ in the form of five pairs of hollow conical processes, with secondary diverticula therefrom, the same being strengthened by calcareous plates or spicules. The existence of such branchiæ in the *Cidaridæ* was denied by Müller, but insisted on by Alex. Agassiz, in his 'Revision of the *Echini*.' Mr. Stewart, in his examinations of a spirit specimen of *Dorocidaris papillata*, around the buccal membrane, failed to perceive them; but on removing the dorsal half of the corona, discovered five organs within, which functionally take the

place of the absent external branchiæ. He states that the size of the jaw-chamber is increased by the raising of the "compasses" when the transverse muscles contract, especially if the jaws be protruded. Under such conditions water finds ingress by a crevice produced, and the interiorly-placed gills thus bathed. The peculiar mechanism of the teeth and jaws was here explained, and the function of the so-called "compasses" noted. As regards the "pedicellariæ" of the *Cidaridæ*, Mr. Stewart observed that when the jaw ends in a terminal fang the chamber has a second opening in addition to the large triangular tooth-armed orifice near the tip, the fang itself being hollow and perforated external to and in front of the tip. He suggests that this probably serves as a channel for the injection of a poison, secreted by two glands placed in the vicinity of the pedicellarian head. He compares this to the falces of the spider or to the poison-fangs of venomous serpents. Another point to which he called attention was that in *Cidaris tribuloides* and *Phyllacanthus bucculora*, in addition to the calcareous arches bridging over the ambulacral pores (J. Müller's vertebral processes) there are delicate solid spines between each pair of pores, which project downward and tend to arch over the ambulacral vessel. These spines recall the similar processes scattered over the inner surface of the corona of the *Clypeastridæ*. He further showed the genital gland of *Dorocidaris papillata* as possessing a calcareous spicular framework, and that the abundance or paucity of these vary considerably according to circumstances. In Sir Wyville Thomson's lately-described new species of *Cidaris* (*C. nutrix*), the latter condition is dwelt on as distinguishing it from *D. papillata*—a consideration which may hereafter require to be modified.

A short note "On the Migration of Wild Geese," by Dr. R. C. A. Prior, was read, in his absence, by the Secretary, and was to the effect that an immense flock of Wild Geese had lately passed over the Azores, and these were supposed to have come from Newfoundland and to be on their way towards Morocco. He considered that a wide dispersion of the seeds of water-plants would be likely to result from such a migration.

Mr. Charles O. Waterhouse communicated a "Report on a small Collection of Insects obtained by Dr. J. C. Ploëm in Java, with a Description of a new Species of *Hoplia*." These insects had been collected in the vicinity of Sindang-læja, and transmitted safely to England by post in the hollow of a piece of bamboo. Besides a number of specimens of the new species (*Hoplia aurantiaca*) there were examples of *Popilia biguttata*, Wied., *Chalcosoma atlas*, Linn., *Dascyllus fulvulus*, Wied., a variety, *Rhyparida*? sp., and some undetermined species of *Gryllus* and *Forficula*.

Several botanical papers were then read, and some exhibitions followed.—
J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

November 20, 1877.—Professor FLOWER, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of October, 1877, and called special attention to a Layard's Flying Squirrel, *Sciuropterus Layardi*, presented by Sir Charles Peter Layard, October 8th, and to a pair of East African Buffaloes (*Bubalus aquinoctialis*), purchased 27th October.

Mr. Howard Saunders exhibited a specimen of the rare Aleutian Tern, *Sterna aleutica*, from Alaska, and made remarks upon its intermediate position between typical *Sterna* and the group of Sooty Terns (*Onychoprion*).

A communication was read from the Marquis of Tweeddale, containing an account of a collection of birds made by Mr. A. H. Everett in the Island of Zebu, Philippines. Six new species were found in this collection, and were named *Oriolus assimilis*, *Phyllornis flavipennis*, *Zosterops Everetti*, *Prionochilus quadricolor*, *Turnix nigrescens* and *Megapodius pusillus*.

Three communications were read from Dr. O. Finsch. The first contained a report on a collection of birds made at Eua, Friendly Islands, by Mr. F. Hübner, which had increased our knowledge of the avifauna of Eua, from four to twenty-four species. The second contained a description of a collection of birds made on the Island of Ponapé, Eastern Carolinas, by Mr. J. Kubary. The total number of species known at present from Ponapé was stated to be twenty-nine, of which seven were peculiar to the Island. The third contained a list of the birds obtained at Ninafou Island in the Pacific, by Mr. F. Hübner. This collection raised the number of the known birds of this island from one to twenty.

Prof. Garrod read notes on the *Tania* of the Rhinoceros of the Sunderbunds, *Plagiotania gigantea*; on the anatomy of the Chinese Water Deer, *Hydropates inermis*; on the possible cause of the death of a young Seal; and on the occurrence of a gall-bladder in certain species of Parrots.

Mr. Howard Saunders read a paper on the *Laridae*, collected during the voyage of H.M.S. 'Challenger,' which comprised nine species of *Sterna*, five of *Laridae*, and three of *Stercorarina*, altogether seventeen species, represented by forty-seven specimens; several of these were very rare in Museums, although none of them were absolutely new to science.

A communication was read from Dr. A. B. Meyer, containing some additional proofs of the fact that the Red *Eclecti* are the females of the Green species of that genus.

A paper was read by Mr. G. French Angas, containing "Notes on *Helix sepulchralis* of Ferrusac and its allies, with Descriptions of two new Species."

December 4, 1877.—Professor NEWTON, M.A., F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of November, 1877, and called special attention to a young example of the Brown Pelican, *Pelecanus fuscus*, from the West Indies, purchased November 6th, and to an example of the Red or Brazilian Wolf, *Canis jubatus*, purchased November 30th. Of this last-named remarkable carnivore no specimen had been previously brought alive to Europe.

Mr. Henry Seebohm exhibited and made remarks upon some of the rarer eggs and birds which he had obtained during his recent visit to the Arctic Regions of the Yen-e-sey, in Eastern Siberia, and gave a rapid sketch of his journey. Some of the skins were interesting from the fact that they extended our knowledge of geographical distribution, such as *Phylloscopus trochilus* and *Acrocephalus schænobæus*, from long. 88° E., *Anthus Gustavi* of Swinhoe (*A. Seebohmi* of Dresser and *A. batchianensis* of Gray) from the same longitude, and young in first plumage of this species.

Mr. Saville-Kent exhibited the plans of a Zoological Station and Museum and Institute of Pisciculture to be established at St. Heliers, Jersey. The object sought in the establishment of this Institution was the provision within British waters of facilities for pursuing marine biological investigations similar to those which exist at the Zoological Station of Naples and at the Anderson School of Natural History at Penikese Island, Buzzards Bay, U.S.A.

The Secretary exhibited, on the part of Mr. Andrew Anderson, some specimens of Natural History collected in India, amongst which were chicks of *Rhynchops* and specimens of *Podiceps cristatus* obtained breeding in North-Western India.

A communication was read from Mr. Henry Lee, containing an account of the capture of a Risso's Grampus at Sidlesham, near Chichester.

Mr. A. G. Butler read a paper in which he gave an account of a collection of Lepidoptera, made in Northern Formosa by Mr. H. E. Hobson.

A communication was read from the Marquis of Tweeddale, containing an account of a collection of birds made by Mr. A. H. Everett in the Island of Mindanao, Philippines. Eight new species were found in this collection, and were named *Tanygnathus Everetti*, *Mulleripicus fuliginosus*, *Penelopides affinis*, *Criniger Everetti*, *Orthotomus nigriceps*, *Æthopyga bella*, *Anthothreptus griseigularis*, and *Ptilopus incognitus*.—P. L. SCLATER, Secretary.

ENTOMOLOGICAL SOCIETY OF LONDON.

Nov. 7, 1877.—Prof. WESTWOOD, M.A., F.L.S., President, in the chair.

Donations to the Library were announced, and thanks voted to the donors.

Mr. M'Lachlan exhibited ten of the thirteen species of Lepidoptera collected by Captain Feilden and Mr. Hart in Grinnell Land, between the parallels of 78° and 83° N. lat., during the recent Arctic Expedition. They consisted of *Colias Hecla*, Lef., var.; *Argynnis polaris*, Bdv.; *A. Chariclea*, Schnd., many vars.; *Chrysophanus phlæas*, Linn., var.; *Lycæna Aquilo*, Bdv.; *Dasychira Grænländica*, Wocke; *Mamestra*? n. sp.; *Plusia parilis*, Hübn.; *Psycophora Sabini*, Curt.; and *Scoparia*, n. sp. He entered into some details respecting the insects generally of this high northern region and their habits, in anticipation of his extended Report to be read at the next meeting of the Linnean Society.

The Rev. A. E. Eaton remarked, with regard to Arctic insects, that he was disposed to consider that their transformations may sometimes be protracted through two or more summers. He adduced some apparently analogous phases in respect of plant life in Spitzbergen, where he had noticed, in June, plants seemingly upon the point of flowering, which had evidently remained in that state under the snow since the previous autumn. He said that in the islands referred to insects are not altogether indifferent to the approach of midnight, although the diurnal variation of light does not, in July, equal in intensity the difference between rural sunshine in this country and the light which passes for daylight in London when the sky is slightly overcast. He mentioned, in conclusion, that no *Bombus* has been hitherto found in Spitzbergen, and that *Pedicularis hirsuta* appeared to be unvisited by insects in that archipelago.

In reply to a question from the President as to the habits of the Arctic *Culex*, the Rev. A. E. Eaton remarked that when in Spitzbergen he had suffered much from the attacks of this insect, which had the habits of a true mosquito.

Mr. Meldola exhibited a five-winged specimen of *Gonepteryx rhamni*, caught near Brandon, Norfolk, in August, 1873, by Mr. John Woodgate. He also exhibited a gynandromorphic specimen of *Pieris brassicae*, taken near Thame, Oxfordshire, by Mr. J. B. Watson, in August, 1877. In this last specimen the right fore and hind wings were female and the left male; the right antenna was also longer than the left.

Mr. H. Goss exhibited an hermaphrodite specimen of *Gonepteryx rhamni*, caught in Abbot's Wood, Sussex. He stated that he believed the specimen to be what Oechsenheimer called a "perfect hermaphrodite," the whole of the right side, both in characters and organs, being female, and the whole of the left side male. Mr. Goss remarked that from the recorded instances of hermaphroditism among the Lepidoptera it appeared that it was more

common for the *left* side to belong to the female sex, and that in fourteen out of twenty-three instances of perfect hermaphrodites cited by Burmeister this was stated to be the case, and only in nine instances out of the twenty-three did the female characters and organs appear on the right side.

Mr. J. W. Douglas exhibited the following insects:—

1. An example of *Polyphylla Fullo*, Linn., which flew on to a steam vessel at Antwerp in August, and was thus brought to London.

2. A specimen of *Tettigometra impressopunctata*, Duf. (a rare species, and the only representative of the genus in Britain), which was taken casually, on October 1st, at Sanderstead Downs, this being the fourth recorded locality in this country.

3. An example of *Typhlocyba debilis*, Doug., taken at the same time and place as the last-mentioned; also *T. tenerrima*, H.-Schf., its nearest ally, to show the difference of the species.

Mr. W. C. Boyd exhibited a larva of *Pieris rapæ*, which had been attacked by *Microgaster*. (See Proc. Ent. Soc., July 5th, 1875, and December 6th, 1876.)

Prof. Westwood read notes on new exotic lamellicorn Coleoptera, and exhibited specimens of *Calomelopus Nyassæ* and *Amblyodus Nicaragua*, also drawings of these beetles and of *Valgus furcifer*, Sumatra; *Nicagus obscurus*, North America; *Cyclidius velutinus*; *Cremastocheilus crassipes*, California; and *Pantodinus Klugii*, Guatemala.

Prof. Westwood, *à propos* of Mr. Wood-Mason's discovery of stridulating apparatus in scorpions, announced to the Society at the September meeting, called the attention of the Society to a letter in 'Nature' (Nov. 1st, 1877, p. 11), from Mr. J. Saville Kent, on a sound-producing crustacean.

Mr. Wood-Mason remarked that structures in Crustacea, some of which certainly, and all of which probably, are for the production of sounds, were first brought to notice by Hoffmann,—in V. der Decken's 'Reisen in Ost-Africa (Crustaceen)'—but had been independently observed by himself in a number of species during his dredging excursion to the Andaman Islands in 1872. They were paired organs, as in Scorpions, the Mygale, and the Phasma to be brought to notice that night—that is to say, organs working perfectly independently of each other were on each side of the body.

Mr. Wood-Mason then announced the discovery of stridulating organs in *Phasmidæ*, in a species of *Pterinoxylus*, and in illustration of his remarks exhibited an impression of Westwood's plate of Serville's species, *P. difformipes*. Here, as in Crustacea and some other Arthropods, an apparatus working perfectly independently of its fellow was developed on each side of the body. The rough prominent basal portion of the costal nervure of the wings formed the rasp, in connection with which was developed a large oval "speculum," "talc-like spot," or "mirror." The rasps were scraped by the sharp and hard front edges of the tegmina, the dome-like form of which

seemed admirably adapted and probably did, to some extent, serve to increase the sound by resonance. In Serville's species, according to Westwood's figure, the stridulating apparatus appeared to be more highly developed, the "mirror" being more distinct and the tegminal cavities much more spacious. The males of the *Pterinoxylus* were unknown.

Professor Westwood mentioned the formation of a "Channel Islands' Museum and Institute of Pisciculture Society" in Jersey.

The President also brought under the notice of the Society a recently-published paper by Dr. Anderson (Proc. As. Soc. Beng., Aug. 1877), containing an account of *Gongylus gongylodes*, Linn., a remarkable Indian *Mantis*, the pupa of which is stated to resemble a flower, both in colour, marking, form, and attitude, this resemblance being, it is suggested, for the purpose of attracting insects on which the pupal *Mantis* feeds.

Mr. Wood-Mason stated that the remarkable form and coloration of *Gongylus gongylodes*, and of other species of *Mantida*, had been known to him for years, but had remained an inexplicable puzzle till December, 1875, when his valued and talented correspondent, Mr. S. E. Peal, of Assam, informed him that he had just captured "a little rose-pink *Mantis* that simulates a blossom beautifully;" and six months later a second "beautifully white (wax-white) and larger than the previous pink one." On examination these specimens proved to be larvæ of *Hymenopus bicornis* of Serville, an insect of great rarity, and only up to that time recorded from Java. The species had the thighs of the four posterior legs expanded into broad pear-shaped plates; so that when seated on a twig with thorax and abdomen raised at right angles to one another, with the fore-legs drawn out of sight under the thorax, and with the four expanded thighs of the rest of the legs spread out two on each side, the "feet" of all these legs being brought to one spot, in form as well as in colour it must present a most perfect and deceptive resemblance to a flower. Here form conspired with colour in a most inimitable manner to produce the deception. The principal reason why this observation of Mr. Peal's was not published long ago was that there was no evidence that insects were attracted to the coloured Mantises as insects to flowers, for if this were not so the resemblance was meaningless; but the evidence required having been published by Mr. Wallace in the September number of 'Macmillan's Magazine,' he had come prepared to make known Mr. Peal's and his own observations, little expecting that reference would be made to the same subject from the chair. According to Mr. Wallace, a small *Mantis* which exactly resembled a pink *Orchis*-flower was shown to Sir Charles Dilke in Java. This species was not only said to attract insects, but even the kind of insects (butterflies) which it allures and devours was mentioned.

Sir Sidney Saunders then read some remarks on the specific identity of a spider (*Atypus*) taken at Hampstead.

Mr. C. O. Waterhouse read a paper containing "Descriptions of new Species of the Coleopterous Genus *Callirhipis* (*Rhipidoceridæ*) in the British Museum," and exhibited specimens of *C. longicornis*, male, Waterh. (Andaman Islands), and *C. dissimilis*, male and female, Waterh. (Borneo).

The Rev. H. S. Gorham communicated the continuation of his "Descriptions of New Species of *Cleridæ*, with Notes on the Genera and corrections of Synonymy."

Mr. A. G. Butler communicated a paper containing "Descriptions of a New Genus and two New Species of *Sphingidæ*, with general Remarks on the Family."

Mr. J. S. Baly communicated "Descriptions of New Genera and of uncharacterized Species of *Halticinae*."

December 5, 1877.—J. W. DUNNING, M.A., F.L.S., Vice-President, in the chair.

Donations to the Library were announced, and thanks voted to the donors.

Mr. W. L. Distant exhibited two rare species of Hemiptera-Heteroptera from the West Coast of Africa, viz. *Tetroxia Beauvoisii*, Fairmaire, and *Oncocephalus subspinosus*, A. & S.

Mr. F. Smith exhibited a fine series of both sexes of *Macropis labiata*, captured by Mr. J. B. Bridgman, of Norwich, at Brundall, near that city. A British specimen of the male had for many years been unique in the collection of the British Museum; at length a second male was taken in the New Forest by the late Mr. J. Walton, and twenty years subsequently Mr. S. Stevens took a third at Weybridge. During the past season Mr. Bridgman took both sexes in some numbers.

Mr. Smith also exhibited a specimen of *Rophites quinquespinosus*, captured at Guestling, near Hastings, by the Rev. E. H. Bloomfield during the past season. This capture added a genus and species to the British Hymenopterous fauna, and was the most important addition that had been made for many years.

Mr. Meldola exhibited three photographic enlargements of micro-photographs by Mr. Edward Viles, of Pendryl Hall, Wolverhampton. These photographs, two of which were of parts of insects,—viz. the mouth organs of a bee and the proboscis of a fly,—had been exhibited at the recent Exhibition of the Photographic Society of London, and had obtained one of the Society's medals. The original negatives, taken by means of the object-glass of a microscope fitted into the camera in place of the ordinary lens, were 3 inches square, while the finished enlargements were 30×24 inches, being thus enlarged 10 diameters.

Mr. Meldola next exhibited an acoustical experiment illustrating the effects of resonance in increasing the volume of sound emitted by

a vibrating bell. This illustration gave experimental demonstration of the action of the stridulating apparatus of the *Pterinoxylus* mentioned at the last meeting by Mr. Wood-Mason.

A discussion followed, in which Messrs. Wood-Mason, M'Lachlan and F. Smith took part.

Mr. J. W. Dunning called the attention of the Society to a paper recently published in the 'Proceedings' of the Cambridge Philosophical Society (vol. iii., part ii., Feb. 12th, 1877), "On a striking instance of Mimicry, with some Notes on the Phenomenon of Protective Resemblance," by Mr. Neville Goodman, M.A. The insect mimicked is the well-known hornet, *Vespa orientalis*, which is found commonly round the shores of the Mediterranean, and extends through Upper Egypt, Syria and Arabia, into Hindostan. The imitator is a species of *Laphria*, the resemblance consisting in similarity of colour, size, shape, attitude when at rest, and mode of flight. The author points out that the word "mimicry" is best applied to cases of resemblance of one living being to another, and suggests that the term "protective resemblance" should be confined to cases of assimilation to stones, sticks, bark, lichens, dead leaves, &c.* The author also refers to the fact that the phenomenon of resemblance (both mimetic and protective) is one of degree, and insists that this fact is entirely in favour of the view of the production of such resemblances through the agency of the "survival of the fittest," but is quite inexplicable on the teleological view of the origin of species.

The Secretary directed attention to a letter in 'Nature' (Nov. 15th, 1877, p. 45), detailing some experiments made upon *Abraaxas grossulariata*, which tended to show that the insect was sensitive to certain sounds, and remarked that these facts appeared to lend experimental support to the existence of an organ of hearing in Lepidoptera, as recently described by Mr. A. H. Swinton (Ent. Mo. Mag., Nov. 1877).

Mr. F. Smith read a paper containing "Descriptions of new Species of Hymenopterous Insects of New Zealand, collected by Prof. Hutton at Otago." The author exhibited a collection of the insects in illustration of the paper, in which seventeen new species are described.

Mr. A. G. Butler read a paper "On the Lepidoptera of the Amazons collected by Dr. James W. H. Trail during the years 1873 to 1875."

Dr. Sharp communicated "Descriptions of eight new Species and a new Genus of *Cossonides* from New Zealand," and "Descriptions of some new Species and a new Genus of Rhynchophorous Coleoptera from the Hawaiian Islands."—R. MELDOLA, *Hon. Sec.*

* I have previously insisted on this distinction (Proc. Zool. Soc., Feb. 4, 1873).—R. M.